

# Some problems in the acquisition of French Phonology : Empirical and theoretical issues

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# What first «phonological unit » has been proposed for French?

1- foot

=> metrical hypothesis

(Gerken, 1994 ; Demuth, 1994, Fikkert, 1994, Rose 2000, Dos Santos, 2007)

2- larger prosodic unit

=> prosodic hypothesis

(Demuth & Fee 1995, Demuth 2001)

3- word

=> whole-word hypothesis

(Francescato, Vihman & Croft 2007, Wauquier 2005)

## What could be relevant (I) ?

Supporters of the metrical (1) and prosodic (2) hypotheses postulate that the prosodic hierarchy is innately available to children - possibly as a phonological module in UG. Much data (in early perception) suggest that the acquisition of phonology is at least partially guided by powerful learning systems

French is the mirror of English? (trochaic bias issue) ..but French

- has no lexical stress
- is not an iambic language
- has no need for the « foot »

**=> 1 & 2 are not realistic and do not fit the French data**

## What could be relevant (II) ?

### 3- word : templatic hypothesis

(Macken, 1994, Vihman & Croft 2007, Wauquier 2003)

- developmental arguments: (communication and learning)

the word is useful for communication, learnable, referential

- phonological arguments:

« Sounds, as we have said, are subjected by the child to a selection by which they become speech sounds only insofar as they are related to language in the strict sense of the word, *i.e.*, to the « arbitrary linguistic signs », according to the Saussurean concept.

[...] phonology begins with the selection of sounds accompanied by the first meaningful use of remembered sound patterns »

R. Jakobson, *Child Language Aphasia and Phonological Universals*, Mouton, 1968,

- possibly matches the French data better

## The template in French : issues

- Does it include clitics : determiners or proto-determiners ?
  - Is it constrained by structural properties of French (prosody, accent, syllable structure) that the children receive as input ?
- How does it evolve ?

# Outline

I) Truncations and reduplications

II) Acquisition of liaisons

III) What about the determiners ?

IV) What about the accent in French ?

V) Prosodic template proposal

VI) Conclusion

# I) Truncations and reduplications

# Truncations and reduplications

- Truncations and reduplications have been observed in children in all languages. they seem not to be constrained by any structural specificity in the target language. Many children use them but not all
  - Truncations are very frequent, have been considered as adaptation strategies reflecting constraints of articulation, perception or grammar (size of the units available in the prosodic hierarchy)
  - Reduplications have also been very frequently observed and interpreted as an articulatory strategy (Frame then Content, MacNeilage), a perception constraint, an intermediate stage between babbling and variegated words, or as play
- => But in summary : truncations and reduplications are strategies which are used to deal with**
- **Word length**
  - **Syllable variegation**



# Patterns of truncations and reduplications in our data

## Clara (French Canadian)

### [1] Mono and bisyllabic words

age	Orthography	translation	target	production
01;04.07	oiseau	a bird	[wazo]	[əwæzʊ]
01;04.07	lit	bed	[li]	[əji]
01;04.14	puppy	Puppy	[pupi]	[əpoepi]
01;04.15	sandale	sandal	[sãdal]	[ədadae ]
-				

### [2] Trisyllabic et quadrisyllabic words

01;09.29	pantalon	trousers	[pãtalõ]	[ətælo]
01;11.18	magnétophone	tape recorder	[maetofɔn]	[əfɔfɔn]
02;00.02	coquelicot	poppy	[kokliko]	[əpiko]
02;02.07	espadrille	sandal	[ɛspadrɪj]	[əpadri]

Truncations appear only in tri- and quadrisyllabic words and always preserve the end of the word and a vowel at the beginning

# Patterns of truncations and reduplications in our data

## Claire (French)

age	orthography	translation	Forme produite
01;10;03	le chat	the cat	[ləʃa]
01;10,04	la vache	the cow	[əʃa ]
01;10,04	la vache, l'âne	the cow	[laʃa] [lətan]
01;10,06	le pot	the pot	[ləpo]
01;10 ;03	le bébé	the baby	[ləbebe]
01;10,04	le ballon	the balloon	[abalɔ̃]
01;10 ;03	un éléphant	an elephant	[oejɑ̃]
01;11,06	le hérisson	a hedge-hog	[ləijɔ̃]
01;11,05	la brosse à dent	a tooth-brush	[anadɑ̃]
01;10,06	un médicament	a medicin	[apamɑ̃]

Claire shows the same pattern : truncations appear only on tri and quadri syllabic words and always preserve the end of the word and a vowel at the beginning

# Patterns of truncations and reduplications in our data

data from Braud (1998, 2003) : simultaneous truncations and reduplications on the same words

Monosyllabic words	Trisyllabic words	Quadrisyllabic words
« ours » [ɛ̃nunURS]	« arrosoir » [ɛ̃RORɔZwAR] [ɛ̃RearOZwAR]	« aspirateur » [ɛ̃RaRastatoeR] [ɛ̃Raʔatatoe]
« os » [ɛ̃nonos]	« coccinelle » [ynkokosinɛl]	« accordéon » [ɛ̃RaRaʝɔ̃]
		« épouvantail » [ɛ̃pupuvãtaj]
		« hélicoptère » [ɛ̃nenikɔtɛ] [ɛ̃niniKɔptɛR]

The determiner is preserved, the first syllable is truncated and the internal syllable is reduplicated

## # Generalisations

- truncations only on long words > 2 syllables
- left edge and last syllable preserved
- truncation of first syllables of words
- reduplication of internal syllables
- reduplication seems to be a lengthening strategy in which lengthening uses the same segmental stuff

## **II Acquisition of liaisons**

# What is liaison ?

At lexical boundaries V# V

- appearance of a latent consonant on the boundary  
word 1 # LC # word 2

"le petit ami" : "le petit" [ləpəti] + "ami" [ami] is pronounced  
[ləpətitami] (*a little friend*)

- resyllabification of the consonant at the onset of the second word

[ləpətitami] is syllabified [lə-pə-ti-ta-mi]

- but in some cases the LC could resyllabify as the coda of word 1

[ləpətitami] is syllabified [lə-pə-tit-a-mi]

# Liaison is variable

- Obligatory liaison

- « un enfant »,
- « en Amérique »
- « nous allons »
- « tout à coup »

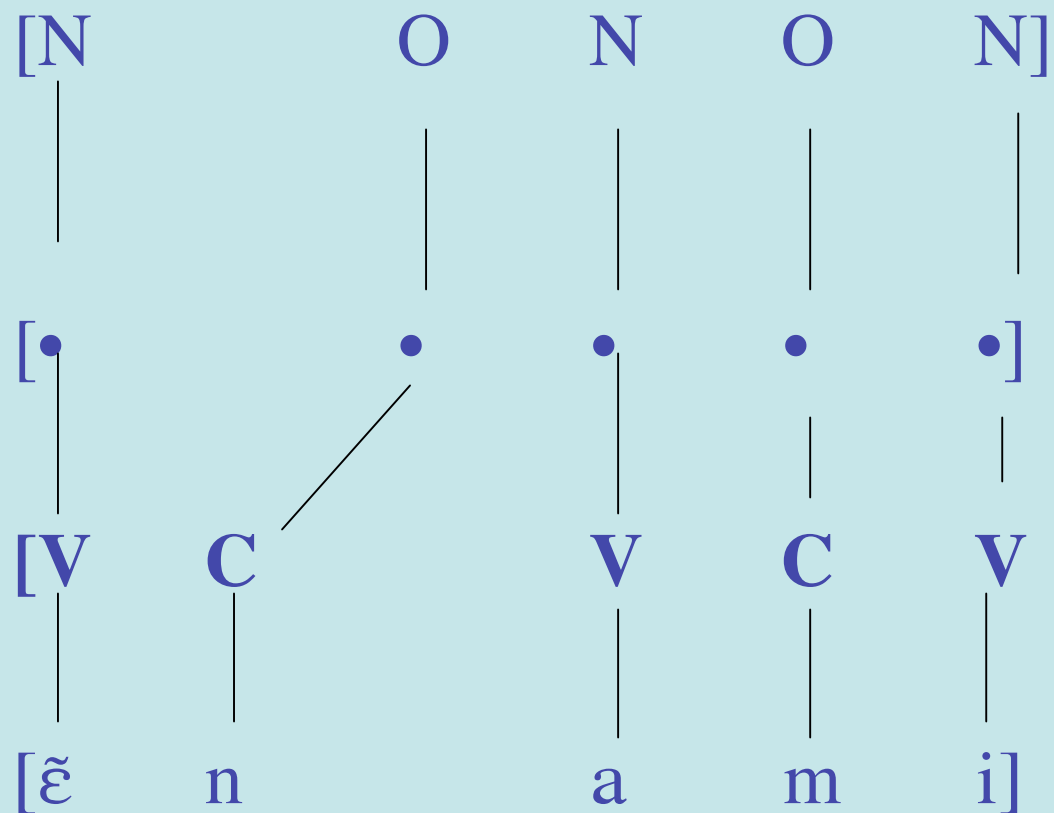
- Facultative liaison

- «des soldats anglais »
- «je vais essayer »
- « très intéressant »
- « toujours utile »

- Prohibited liaison

- « un soldat anglais »
- « des héros »
- « et on l'a dit »

# LC is a floating segment





# Errors observed in liaisons

- Systematic errors between ages 2 and 4 years  
errors only in obligatory contexts : between noun and determiner

\*[lenelefã] \*[lefefefã] for [lezelefã]; \*[lejajo] for [lezwazo]  
\*[papatuRs, papanuRs] for [papa/uRs]

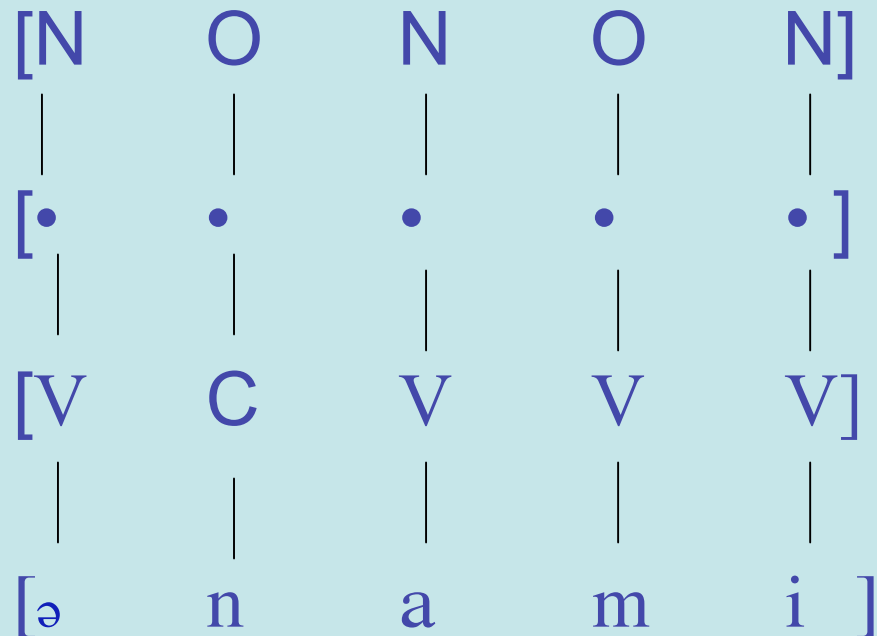
Critical period between 2 and 3 years => adult L1 French speakers make no errors in obligatory liaisons

- Errors in optional contexts from 7-9 years and thereafter at any age

[vuzaveteape] for [vuzavezeteape]

- adult L2 French speakers, even with a high level of competence, make systematic errors in liaison, in obligatory as well as optional contexts

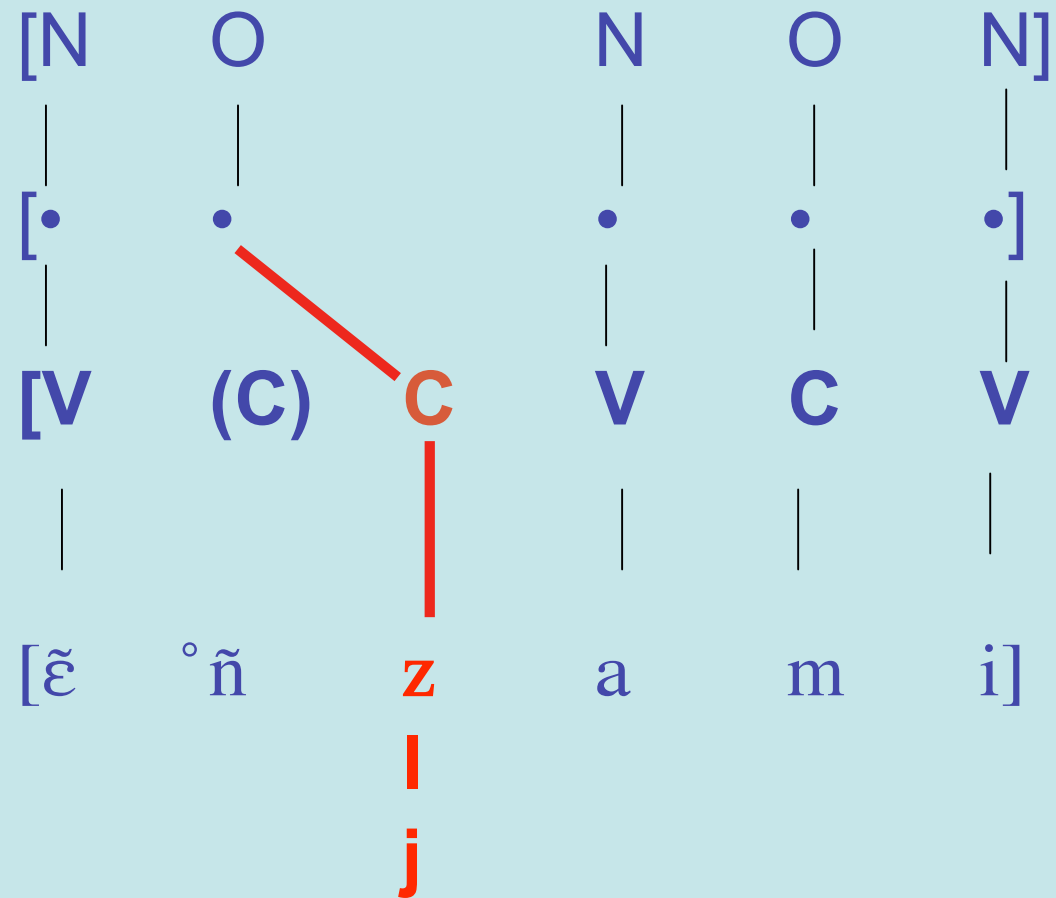
## Acquisition stage I : before the errors, nothing floats



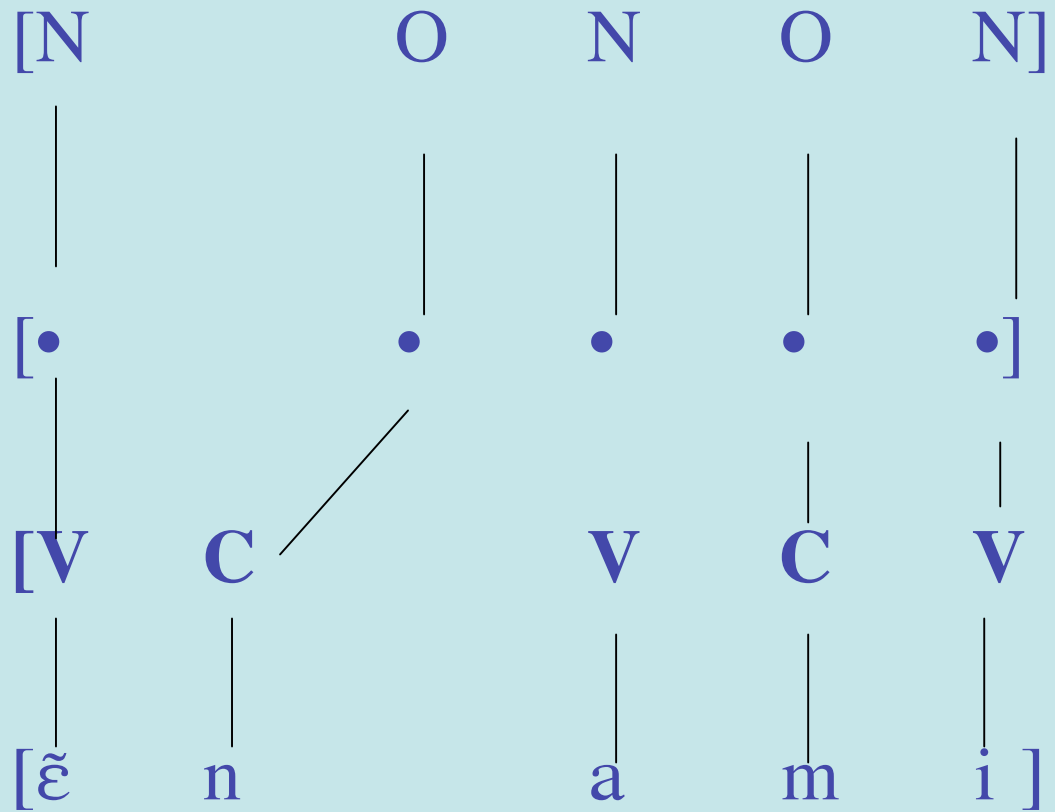
Hypothesis which fits with available early data in all languages. Tendencies to

- avoid branching onsets
- avoid empty nuclei and empty onsets
- CVCV segmentation (Peters 1985)

## Acquisition stage II : period of errors



# Acquisition stage III : like adults



# # Generalisations

- errors appear when children segment the speech stream and detach the determiner.

S1 Each segment of the whole-word unit is fused. Nothing floats

S2 When they detach the determiner LC is wrongly interpreted as the onset of W2

S3 They internalise the fact that the determiner is carrying a LC and that there is allomorphy

- first stage (before 2;5) children seem to internalise the determiner as a part of the whole-word unit

- this seems to confirm what we observed for truncations

**=> the early unit includes a syllable or at least a syllabic nucleus at the left edge, before the noun**

### **III) What about determiners**

# Do french children produce early determiners (I) ?

- 1061 items in kindergarten
- 6 children 17-28 months
- 3 production categories (table 1)
  - « nouns » : nouns with and without determiners (« tortue » / « une tortue » / « la tortue ») or with a presentative (« c'est une tortue », « voilà la tortue », / « c'est tortue », « voilà tortue »).
  - « IP » : items with a verb (« j'en ai à la maison, moi », « oui, ils sont beaux », « il est tout doux le lézard », « arrête »).
  - « others »: adverbs (ex :« oui », « non», « encore ») adjectives with or without a presentative « bleu », « c'est bleu »

## Do french children produce early determiners (II) ?

<i>Nouns</i>	<i>IP</i>	<i>others</i>
64 %	21%	15%

=> they produce mainly nominal categories - mainly nouns



## Do french children produce early determiners (III) ?

4 categories for nouns

- N+D : isolated nouns : « tortue »
- N-D : nouns with determiners : « la tortue » « une tortue »
- P-D : presentative without determiners : « c'est tortue » « voilà tortue »
- P+D : presentative with determiners : « c'est la tortue » « voilà la tortue »

<i>N-S</i>	<i>N+D</i>	<i>P-D</i>	<i>P+D</i>
28%	72%	41%	59%

**=> children produce mainly nouns with determiners**

## Template in French : first issue

- **Does it include clitics : determiners or proto-determiners ?**

=> we could assume that the first unit in French in the framework of the « whole-word hypothesis » is typically a noun but not an isolated noun

=> this first unit includes one syllable or at least one nucleus before the noun

=> children seem to start from a global form and extract the determiner around age 2 / 2;5 during the lexical explosion and by morphological bootstrapping

## **IV) What about accent ?**

## What French is NOT

- French is not a lexical-stress language

The accent falls on the last full syllable of a group (syntactic, semantic or breath group)

Marie aime son **cheval** (Mary loves her horse)

Marie aime son cheval **noir** (Mary loves her black horse)

Marie aime son cheval noir **et blanc** (Mary loves her black and white horse)

The accent falls on the last full syllable of a group (syntactic, semantic or breath group). It is constrained by the phrasing of the utterance

Marie et son **cheval** /traversent la forêt au **galop**

Le cheval de **Marie** / traverse la forêt au **galop**

Il n'est pas rare que le **matin** / Marie traverse la **forêt**

La responsabilité de **Marie** / est entière dans cet **accident**

## What French is NOT

- French is not an iambic mirror image of English

The French metrical unit is the syllable. Verses are counted in syllables and not in feet

Voici des fruits, des fleurs, des feuilles et des **branches**  
Et puis voici mon cœur qui ne bat que pour **vous**  
Ne le déchirez pas avec vos deux mains **blanches**  
Et qu'à vos yeux si beaux l'humble présent soit **doux**  
*Green, Verlaine*

C'est un trou de verdure où chante une **rivière**  
accrochant follement aux herbes des haillons  
d'**argent**, où le soleil de la montagne fière  
**luit**. C'est un petit val qui mousse de **rayons**  
*Le dormeur du Val, Rimbaud*

# Proposals

- French has an accent at the end of a group / an utterance and a counter-accent at the beginning (Fonagy, Rialland, Vaissière, Di Cristo)
- Di Cristo assumes an « accentual arch » with shortenings and reductions inside of a group with salient edges

« **Ma**rie s'en va tous les jours en vélo au mar**ché** »

“ une tendance à accentuer la syllabe initiale des mots, ce qui donne naissance à la formation de schèmes barytoniques et **d'arcs accentuels dans lesquels seules les syllabes initiales et finales d'un groupe de mot reçoivent un accent.**

A Di Cristo, Le cadre accentuel du français contemporain: essai de modélisation, *Langues*, vol.2,3, p.185

## Template in French : second issue

- **Is it constrained by the structural properties of French (prosody, accent) that children receive as input ?**

=> We could assume that French infant speech segmentation is constrained by the prosodic structure

=> Is the initial whole-word unit determined by the accentual-arch structure ?

## **V) Prosodic template proposal**



# Template for French in an autosegmental framework

$[, \sigma (\sigma)_n ' \sigma ]$

- accent on the last syllable / counter-accent on the first. Those syllables are strong positions that children establish first. They are never truncated and rarely modified
- « n » number of internal syllables ( $n < 2$  before age 3). Those internal syllables are instable. Segmental reorganisation, lengthening, truncations, variegations are realised from the « n » syllables
- this unit is the domain of emergence of phonology
- this unit is referential

## Advantages of the template hypothesis

- it accounts for the autosegmental dimension of child production (spreading, harmony, reduplications, truncations, metathesis)
- it accounts for the determiner / proto-determiner issue
- it fits the prosodic structure of French. It is compatible with the accentual arch structure
- it fits the French child data
- It is referential and can be segmented in the input : no need to postulate mysterious innate representations (e.g. a prosodic hierarchy)

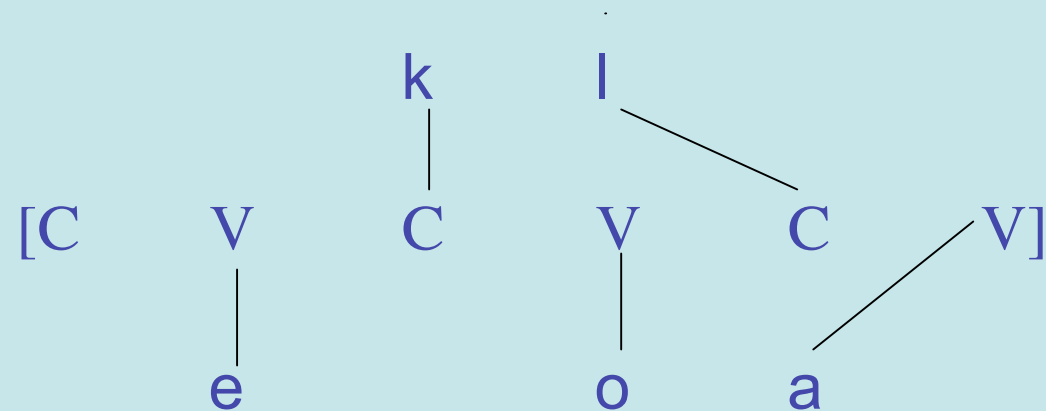
## Template in French : third issue

- **How does it evolve ?**

## Example with Claire's data

**Stage 1** [ekola] = le chocolat

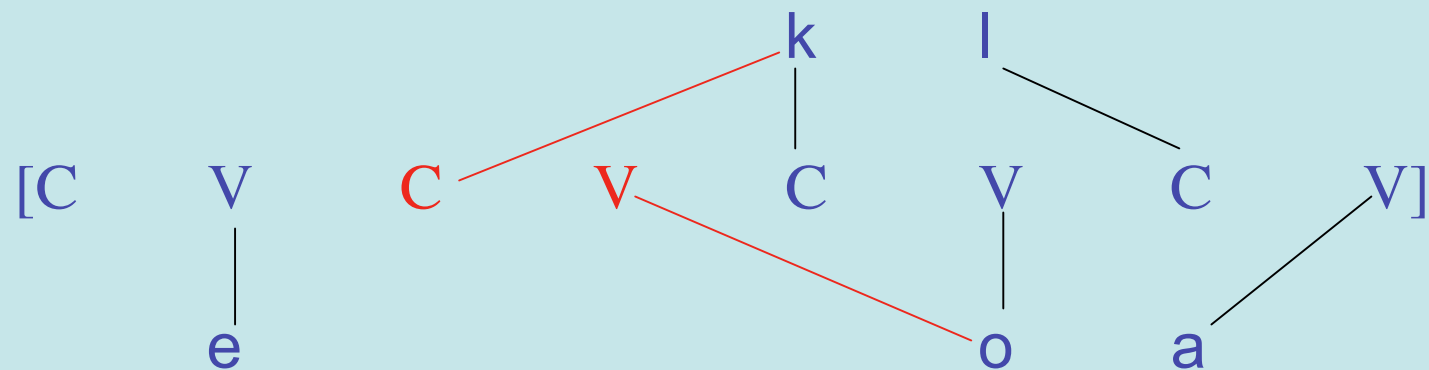
truncation to fit the template n=1



## Example with Claire's data

**Stage 2** [ekokola] = le chocolat

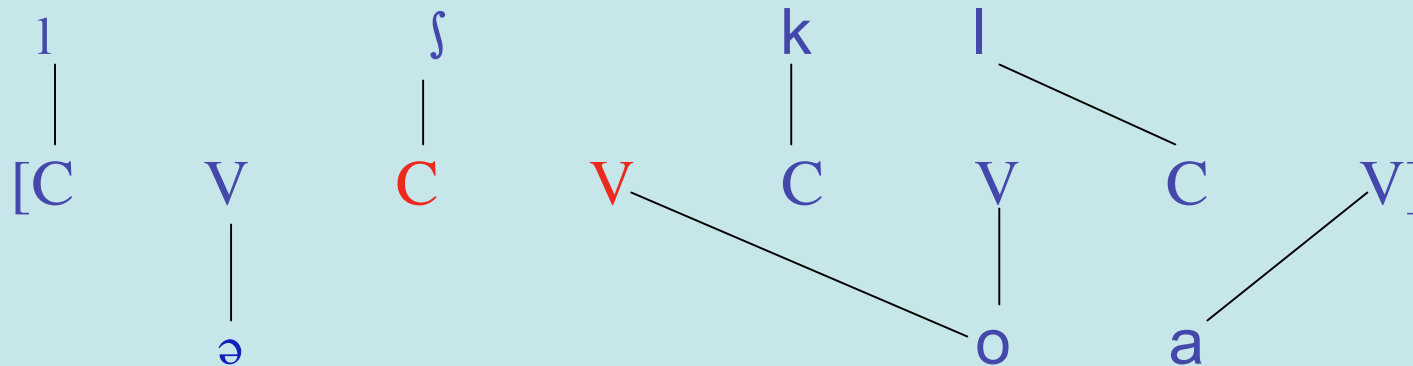
lengthening by adding positions without adding segmental material.  
In this template  $n=2 \Rightarrow$  reduplication



## Example with Claire's data

**Stage 3** [ləʃokola] = le chocolat

variegation of syllables by adding a fricative  
In this template n=2



## Conclusion

- the template is a realistic unit : referential, segmentable from the input
- it is a structured abstract unit, it can account for
  - number of positions
  - relationships between onsets and nuclei
  - phonotactic constraints

=> it is an emerging and motivated structure, built by the child on the basis of the input structure. It is the domain of phonological generalisations and processes (spreading, truncations ...)